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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

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Filing Date: December 29, 2000 Appellant(s): HENNING, RUSSELL E.

Application Number: 09/751,129

Technology Center 2600

Timothy N. Trop (#28,994) <u>For Appellant</u>

EXAMINER'S ANSWER

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This is in response to the appeal brief filed on 12/20/04.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement is present identifying that there are no related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1-28, and 30-33 stand or fall together because appellant's brief does not include a statement that this grouping of claims does not stand or fall together and reasons in support thereof. See 37 CFR 1.192(c)(7).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

5,455,629	Sun et al.	10-1995
6,289,485	Shiomoto	9-2001
6,552,673	Webb	4/2003

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-2, 6-8, 19-23, 25-28, 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al., (hereinafter referred to as "Sun") in view of Shiomoto.

Claims 3-5, 9, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al., (hereinafter referred to as "Sun") in view of Shiomoto as applied to claims 1 and 22 above, and further in view of Webb.

Claims 10-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sun et al., (hereinafter referred to as "Sun") in view of Shiomoto and Webb.

Sun discloses an apparatus comprising: a first block to process a first type of frame in a video bitstream (Sun: column 7, lines 50-65; column 9, lines 45-56); and a second block to

process a second type of frame in the video bitstream (Sun: column 10, lines 5-10 & 40-67), as in claim 1. However, Sun fails to disclose using first and second error resiliency techniques with the respective first and second blocks. Shiomoto discloses an error concealment apparatus with differing error resiliency techniques based differing code strings (Shiomoto: column 4, lines 10-60) wherein the second error resilience technique replaces a bit pattern from the second type of frame with a shorter bit pattern (Shiomoto: column 4, lines 30-45) in order to reinforce error-correcting abilities (Shiomoto: column 2, lines 1-6). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art to incorporate Shiomoto's differing error concealment techniques for improved error resiliency into the Sun apparatus in order to reinforce error-correcting abilities. The Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames, has all of the features of claim 1.

Regarding claim 2, the Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for first and second frames, has the first block also processing a third type of frame (Sun: column 10,lines 5-10), as in the claim.

Regarding claim 6, the Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames, has the second block insert fewer error resilience bits in the video bitstream than the first block (Shiomoto: column 4, lines 40-50), as in the claim.

Regarding claims 7-8, the Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames, has third and fourth blocks for differing error concealment techniques (Sun: column 6, lines 23-50), as in the claims

Sun discloses an apparatus comprising: a first block to process a first type of frame in a video bitstream (Sun: column 7, lines 50-65; column 9, lines 45-56); and a second block to process a second type of frame in the video bitstream (Sun: column 10, lines 5-10 & 40-67), as in claim 19. However, Sun fails to disclose using first and second error concealment techniques with the respective first and second blocks. Shiomoto discloses an error concealment apparatus with differing error resiliency techniques based differing code strings (Shiomoto: column 4, lines 10-60) wherein the second error resilience technique replaces a bit pattern from the second type of frame with a shorter bit pattern (Shiomoto: column 4, lines 30-45) in order to reinforce error-correcting abilities (Shiomoto: column 2, lines 1-6). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art to incorporate Shiomoto's differing error concealment techniques for improved error resiliency into the Sun apparatus in order to reinforce error-correcting abilities. The Sun apparatus, now incorporating Shiomoto's differing error concealment techniques for the first and second frames, has all of the features of claim 19.

Regarding claim 20, the Sun apparatus, now incorporating Shiomoto's differing error concealment techniques for the first and second frames, has a variable length decoder block (Sun: column 9, lines 15-21), as in the claim.

Regarding claim 21, the Sun apparatus, now incorporating Shiomoto's differing error concealment techniques for the first and second frames, has the second error concealment technique comprising a block copy (Sun: column 12, lines 1-40), as in the claim.

Sun discloses a method comprising: receiving a video stream (Sun: column 7, lines 39-52); performing a first processing step a first type of frame in a video bitstream (Sun: column 7, lines 50-65; column 9, lines 45-56); performing a second processing step on a second type of

frame in the video bitstream (Sun: column 10, lines 5-10 & 40-67), as in claim 22. However, Sun fails to disclose using first and second error resiliency techniques with the respective first and second blocks. Shiomoto discloses an error concealment apparatus with differing error resiliency techniques based differing techniques (Shiomoto: column 4, lines 10-60; column 8, lines 55-67) wherein the second error resilience technique replaces a bit pattern from the second type of frame with a shorter bit pattern (Shiomoto: column 4, lines 30-45) in order to reinforce error-correcting abilities (Shiomoto: column 2, lines 1-6). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art to incorporate Shiomoto's differing error concealment techniques for improved error resiliency into the Sun method in order to reinforce error-correcting abilities. The Sun method, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames, has all of the features of claim 22.

Regarding claim 23, the Sun method, now incorporating Shiomoto's differing error resiliency technique for first and second frames, performing error resiliency on an I frame (Sun: column 10, lines 25-30), as in the claim.

Regarding claim 25, the Sun method, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames, has the second technique inserts fewer error resilience bits in the video bitstream than the first error resilience technique (Shiomoto: column 4, lines 40-50), as in the claim.

Regarding claim 26, the Sun method, now incorporating Shiomoto's differing error resiliency techniques for first and second frames, has the second technique insert fewer error resilience bits into the video bitstream than the first technique (Sun: column 10, lines 40-65), as in the claim.

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Sun discloses an apparatus (Sun: figures 6-7) comprising: a first block to perform error concealment on an encoded video signal to provide an output signal (Sun: column 3, lines 10-20); a second block to determine at least one channel characteristic (Sun: column 12, lines 53-67; column 13, lines 1-13); and a third block to perform resilience on the output signal based on at least one channel characteristic and provide a modified video signal (Sun: column 10, lines 20-30), as in claim 27. However, Sun fails to disclose using first and second error resiliency techniques with the respective first and second blocks. Shiomoto discloses an error concealment apparatus with differing error resiliency techniques based differing code strings (Shiomoto: column 4, lines 10-60) wherein the second error resilience technique replaces a bit pattern from the second type of frame with a shorter bit pattern (Shiomoto: column 4, lines 30-45) in order to reinforce error-correcting abilities (Shiomoto: column 2, lines 1-6). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art to incorporate Shiomoto's differing error concealment techniques for improved error resiliency into the Sun apparatus in order to reinforce error-correcting abilities. The Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames, has all of the features of claim 27.

Regarding claim 28, the Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames, discloses transmitting the modified signal to a storage device (Sun: column 12, lines 45-53), as in the claim.

Regarding claim 30, the Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames, that the first error concealment technique is different than the second technique (Sun: column 12, lines 1-40), as in the claim.

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Regarding claims 31 and 33, the Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames, discloses that the first frames are I frames and the second frames are B frames (Shiomoto: column 8, lines 65-67; column 9, lines 1-10), as in the claims.

Regarding claim 32, the Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames, discloses that the third frames are I frames (Shiomoto: column 8, lines 65-67; column 9, lines 1-10), as in the claim.

The Sun apparatus, now incorporating Shiomoto's differing error resiliency technique for first and second frames, a majority of the features of claims 3-4, as discussed with regards to claim including having the second block comprise a variable length coder (Sun: column 3, lines 40-57), however, the Sun-Shiomoto combination fails to disclose the use of application of resynchronization markers as in the claims. Webb discloses the use of reversible variable length codewords (Webb: column 4, lines 55-68; column 5, lines 1-30) for the application of resynchronization markers (Webb: column 2, lines 20-35) in order to process video with uncorrectable errors (Webb: column 1, lines 30-65). Accordingly, given this teaching it would have been obvious for one of ordinary skill in the art to incorporate Webb's reversible variable length codewords for the application of resynchronization markers into the Sun-Shiomoto combination in order to have the Sun-Shiomoto combination be able to process video streams with uncorrectable errors. The Sun apparatus, now incorporating Shiomoto's differing error resiliency technique for first and second frames and Webb's use of reversible variable length codewords for the application of resynchronization markers, has all of the features of claims 3-4.

The Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for first and second frames, has a majority of the features of claim 5, however, the Sun-Shiomoto combination fails to disclose the use of application of resynchronization markers at differing intervals as in the claim. Webb discloses the use of reversible variable length codewords (Webb: column 4, lines 55-68; column 5, lines 1-30) for the application of resynchronization markers (Webb: column 2, lines 20-35) at differing intervals (Webb: column 12, lines 23-55) in order to process video with uncorrectable errors (Webb: column 1, lines 30-65). Accordingly, given this teaching it would have been obvious for one of ordinary skill in the art to incorporate Webb's reversible variable length codewords for the application of resynchronization markers into the Sun-Shiomoto combination in order to have the Sun-Shiomoto combination be able to process video streams with uncorrectable errors. The Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for first and second frames and Webb's use of reversible variable length codewords for the application of resynchronization markers at differing intervals, has all of the features of claim 5.

The Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for first and second frames, a majority of the features of claim 9, as discussed with regards to claim including a data partitioning block (Sun: column 3, lines 40-57) and a header extension code block (Sun: column 4, lines 45-67). However, the Sun-Shiomoto combination fails to disclose the use application of a reversible variable length coder block and a resynchronization marker block for application of resynchronization markers as in the claim. Webb discloses the use of reversible variable length codeword block (Webb: column 4, lines 55-68; column 5, lines 1-30) and a resynchronization marker block (Webb: column 2, lines 20-35) in order to process

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video with uncorrectable errors (Webb: column 1, lines 30-65). Accordingly, given this teaching it would have been obvious for one of ordinary skill in the art to incorporate Webb's reversible variable length codeword block and resynchronization marker block into the Sun-Shiomoto combination in order to have the Sun-Shiomoto combination be able to process video streams with uncorrectable errors. The Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for first and second frames and Webb's use of reversible variable length codeword block and a resynchronization marker block, has all of the features of claim 9.

The Sun method, now incorporating Shiomoto's differing error resiliency techniques for first and second frames, has a majority of the features of claim 24, however, the Sun-Shiomoto combination fails to disclose the use of application of resynchronization markers at differing intervals as in the claim. Webb discloses the use of reversible variable length codewords (Webb: column 4, lines 55-68; column 5, lines 1-30) for the application of resynchronization markers (Webb: column 2, lines 20-35) at differing intervals (Webb: column 12, lines 23-55) in order to process video with uncorrectable errors (Webb: column 1, lines 30-65). Accordingly, given this teaching it would have been obvious for one of ordinary skill in the art to incorporate Webb's reversible variable length codewords for the application of resynchronization markers into the Sun-Shiomoto combination in order to have the Sun-Shiomoto combination be able to process video streams with uncorrectable errors. The Sun method, now incorporating Shiomoto's differing error resiliency technique for first and second frames and Webb's use of reversible variable length codewords for the application of resynchronization markers at differing intervals, has all of the features of claim 24.

Sun discloses a processor containing instructions that enable the processor to comprising: receive a video stream having at least a first type of frame (Sun: column 7, lines 50-65; column 9, lines 45-56) and a second type of frame (Sun: column 10, lines 5-10 & 40-67), as in claim 10. However, Sun fails to disclose processing using first and second error resiliency techniques on said first and second respective frame types, wherein the first technique discloses the further use of resynchronization markers at a first interval and the second technique using a differing interval than the first. Shiomoto discloses an error concealment apparatus with differing error resiliency techniques based differing code strings (Shiomoto: column 4, lines 10-60) wherein the second error resilience technique replaces a bit pattern from the second type of frame with a shorter bit pattern (Shiomoto: column 4, lines 30-45) in order to reinforce error-correcting abilities (Shiomoto: column 2, lines 1-6). Accordingly, given this teaching, it would have been obvious for one of ordinary skill in the art to incorporate Shiomoto's differing error concealment techniques for improved error resiliency into the Sun apparatus in order to reinforce errorcorrecting abilities. The Sun apparatus, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames, has a majority all of the features of claim 10, however, the Sun-Shiomoto combination fails to disclose the use of application of resynchronization markers as in the claim. Webb discloses the use of reversible variable length codewords (Webb: column 4, lines 55-68; column 5, lines 1-30) for the application of resynchronization markers (Webb: column 2, lines 20-35) in order to process video with uncorrectable errors (Webb: column 1, lines 30-65). Accordingly, given this teaching it would have been obvious for one of ordinary skill in the art to incorporate Webb's reversible variable length codewords for the application of resynchronization markers into the Sun-Shiomoto

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combination in order to have the Sun-Shiomoto combination be able to process video streams with uncorrectable errors. The Sun processor, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames as executed in software (Webb: column 12, lines 10-20) and Webb's use of reversible variable length codewords for the application of resynchronization markers, has all of the features of claim 10.

Regarding claim 11, the Sun processor, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames as executed in software (Webb: column 12, lines 10-20) and Webb's use of reversible variable length codewords for the application of resynchronization markers, has the first error resilience technique to process a P frame (Shiomoto: column 8, lines 65-67; column 9, lines 1-10).

Regarding claims 12-13, the Sun processor, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames as executed in software (Webb: column 12, lines 10-20) and Webb's use of reversible variable length codewords for the application of resynchronization markers, has the second error resilience technique to process a B frame (Shiomoto: column 8, lines 65-67; column 9, lines 1-10), as in the claims.

Regarding claim 14, the Sun processor, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames as executed in software (Webb: column 12, lines 10-20) and Webb's use of reversible variable length codewords for the application of resynchronization markers, has inserting the resynchronization markers at differing intervals (Webb: column 12, lines 23-55), as in the claims.

Regarding claim 15, the Sun processor, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames as executed in software (Webb: column 12,

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lines 10-20) and Webb's use of reversible variable length codewords for the application of resynchronization markers, has the first error concealment technique is different from the second error concealment technique (Sun: column 12, lines 1-40), as in the claim.

Regarding claim 16, the Sun processor, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames as executed in software (Webb: column 12, lines 10-20) and Webb's use of reversible variable length codewords for the application of resynchronization markers, has inserting fewer error resilience bits into the video stream for the B-type frame than for the P-type frame (Shiomoto: column 8, lines 65-67; column 9, lines 1-10), as in the claim.

Regarding claim 17, the Sun processor, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames as executed in software (Webb: column 12, lines 10-20) and Webb's use of reversible variable length codewords for the application of resynchronization markers, has variable length encoding (Sun: column 7, lines 15-30), as in the claim.

Regarding claim 18, the Sun processor, now incorporating Shiomoto's differing error resiliency techniques for the first and second frames as executed in software (Webb: column 12, lines 10-20) and Webb's use of reversible variable length codewords for the application of resynchronization markers, has applying resynchronization markers to the video for B frames (Webb: column 12, lines 25-60), as in the claim.

(11) Response to Arguments

Appellant's arguments filed with respect to claims 1-28 and 30-33 as filed in the Brief of 12/20/04 have been fully considered but they are not persuasive. The Appellant presents five

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collective arguments wherein three arguments address the Examiner's pending rejection of claims 1-2, 6-8, 19-23, 25-28, 30-33 under 35 U.S.C. 103(a) as being unpatentable over Sun et al., (hereinafter referred to as "Sun") in view of Shiomoto, one argument addresses the Examner's pending rejection of claims 3-5, 9, and 24 under 35 U.S.C. 103(a) as being unpatentable over Sun et al., (hereinafter referred to as "Sun") in view of Shiomoto as applied to claims 1 and 22 above, and further in view of Webb, and one argument addressing the Examiner's pending rejection of claims 10-18 under 35 U.S.C. 103(a) as being unpatentable over Sun et al., (hereinafter referred to as "Sun") in view of Shiomoto and Webb. However, after a careful consideration of the arguments the Examiner respectfully maintains that the rejections are proper and should be maintained.

Firstly, the Appellant argues that the secondary Shiomoto reference fails to teach "...a second error resilience technique with a bit pattern for the second type of frame with a shorter length code..." as in claim 1 (Brief: page 12, lines 12-16). The Examiner respectfully disagrees. It is noted that two types of code data. One is a base layer coded data (Shiomoto: column 3, lines 65-67), and the other is a reinforced layer coded data (Shiomoto: column 4, lines 1-10), both of which have a fixed data length of L. One of ordinary skill in the art would associate Shiomoto's base layer coded data with Sun's low priority stream, and Shiomoto's reinforced layer coded data with Sun's high priority stream (Sun: column 6, lines 23-28), since both references show differentiation of coded data in accordance with differing levels of error acceptance (Sun: column 3, lines 10-22; Shiomoto: column 6, lines 10-60). It is noted that the Shiomoto's error correcting encoders also have parity bit addition (Shiomoto: column 4, lines 25-30). This parity bit addition has additions of differing lengths, based on whether the data is base layer coded data

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or the reinforced layer coded data. In particular, it is noted that the parity bit addition for the base layer coded data is 1b bytes (Shiomoto: column 4, lines 25-30), and the parity bit addition for the reinforced layer coded data is 1e bytes (Shiomoto: column 4, lines 35-40), and further discloses that le bytes are smaller (i.e. have a bit pattern that is of a shorter length) than the lb bytes (Shiomoto: column 4, lines 32-34). These parity bit additions are added to both layers in order to employ RS (Reed Solomon) in the apparatus (Shiomoto: column 1, lines 35-60; column 4, lines 25-30), which is also executed by the Sun reference (Sun: column 6, lines 50-60). The bit patterns for the parity bit additions of Shiomoto would have the base layer coded data parity bit addition would be less than the reinforced layer coded parity bit additions, and thus when incorporated into Sun reference, would have "...a second error resilience technique with a bit pattern for the second type of frame with a shorter length code..." based on the bit patterns for the parity bit additions in Shiomoto. Accordingly, the Examiner asserts that the limitation would be met.

Secondly, the Appellants argue that Sun fails to teach two error concealment techniques, wherein the second error concealment technique copies lost data from a second type of frame (Brief: page 12, lines 16-23). The Examiner respectfully disagrees. It is noted that Shiomoto's error correcting encoder is a first and second type of error concealment techniques in that the error is concealed by being corrected based on a first type of parity bit addition or a second type of parity bit addition. Now, to also have the second error concealment technique copying lost data from a previous second type of frame, the Examiner looks to the primary Sun reference. In particular, it is noted for I type of frames including lost data, substitute data would be copied based on a supplied error map (Sun: column 11, lines 48-67), wherein said substitute data would

be copied from a second type of frame (Sun: column 10, lines 15-30). Accordingly, the Examiner notes that the second type of parity bit addition for Shiomoto would also include the lost data compensation from Sun, as well.

Thirdly, the Appellant argues that Shiomoto fails to discloses using a second block to determine at least one channel characteristic (Brief: column 13, lines 1-10). The Examiner respectfully disagrees. The Examiner notes that Sun shows that the channel characteristic would be whether the channel is synchronized or not with regards, or whether the channel has been changed (Sun: column 13, lines 1-13) with regards to the transmitted second block and to initiate the appropriate error resilience techniques as discussed above. Accordingly, the Examiner maintains that this limitation is met as well.

Additionally, the Appellant argues that Webb fails to discloses using a resynchronization marking block for different error resilience techniques for different frame types are used (Brief: page 13, lines 13-26). The Examiner respectfully disagrees. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Webb is not required to show different error resilience techniques for different frame types are used. The Examiner respectfully disagrees, when the Examiner has already addressed those features by discussing Shiomoto's differing length parity bit additions for base layer coded data and reinforced layer coded data, respectively, and Sun's error concealment techniques using substitute data as based on an error map and the frame type. All that Webb needs to show, is that it is known to use resynchronization markers with the Sun-Shiomoto

combination, which has a need for such a feature since error concealment would a function of whether the channel was synchronized or not (Sun: column 13, lines 6-7). The dispersal of inserted resynchronization markers in Webb would different for the HP and LP data streams, but would be necessary especially in order to attain fast synchronization after initiating a priority break point change from the HP data to the LP data (Sun: column 8, lines 1-5). Accordingly, the Examiner maintains that this feature is met as well.

Lastly, the Appellant argues that the references fail to discloses using differing teach using a differing concealment techniques for P and B type frames as in the claims (Brief: page 13, lines 27-31; page 14, lines 1-7). The Examiner strongly disagrees. Firstly, Sun discloses using different substitution data techniques based on the type of frames present (Sun: column 10, lines 15-30; column 11, lines 7-47). And with Shiomoto, the citation also discloses using different or hierarchically encoding of error correcting codes for I, B, and P type frames (Shiomoto: column 8, lines 45-67; column 9, lines 1-15) and further associates the use of le byte length parity bit additions and lb byte length parity bit additions (Shiomoto: column 4, lines 25-40: "le bytes which is smaller than lb bytes") with high priority and low priority data (Shiomoto: column 9, lines 15-26) or the similar terminology used in the primary reference (Sun: column 6, lines 23-30). The use of the differing length parity bit additions are different error resilience techniques based on the length of the parity bit additions (Shiomoto: column 7, lines 5-24). The addition of lb bytes is one error resilience technique, and the addition of le bytes is another error resilience technique. Accordingly, the Examiner maintains that this limitation is met as well.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Andy S. Rao Primary Examiner Art Unit 2613

> ANDY RAO PRIMARY EXAMINER

asr March 4, 2005

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